



# *Pacific Island Network Quarterly*

20th  
edition !

Quarterly Newsletter of the  
Pacific Island Network (PACN)  
Inventory & Monitoring Program  
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*Fine, thanks.  
What is **your**  
transect  
like?*

A multi-agency team of scientists rappels to the floor of a pit crater in the Kahuku area of Hawai'i Volcanoes National Park to conduct a plant survey.





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The National Park Service (NPS) has implemented natural resource inventory and monitoring on a servicewide basis to ensure all park units possess the resource information needed for effective, science-based management, decision-making, and resource protection.

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**Mailing List: Please pass this newsletter on**

**NOTE:** Unless indicated all photos and articles are NPS.  
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## Staff News

The I&M administrative staff has grown by one with the addition of **Eliseo Queja** who serves as the new Administrative Support Clerk for the program.

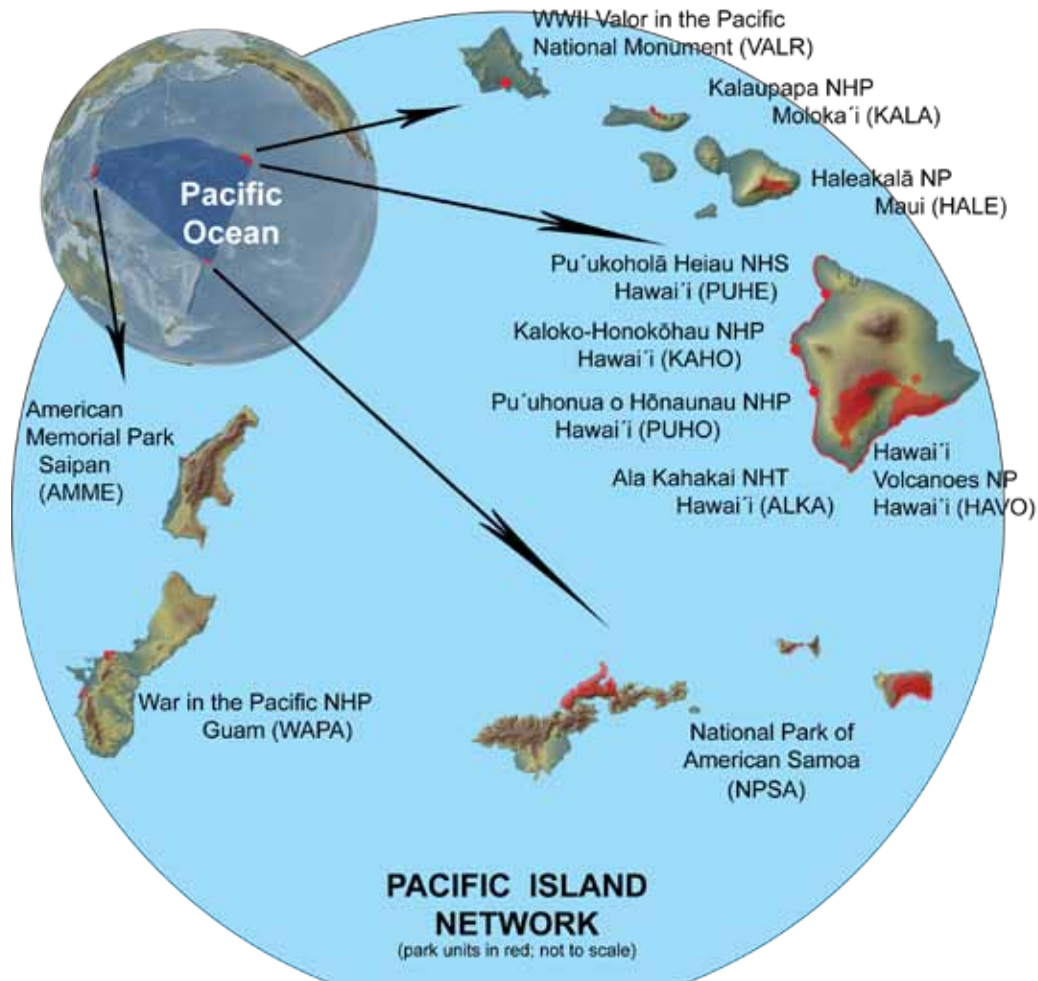
Thanks and aloha to **Mark Aeder, Evan Watson, Barbara Luehrs, and Meghan Jerolaman** for their relentless volunteering with the program. All four of these fantastic volunteers put in several months of difficult (and we hope rewarding) field work on the freshwater animals and the vegetation mapping projects. I&M is delighted that Meghan will continue to volunteer with the aquatic program this summer. Meghan is joined by **Kenji Clemmer**, also volunteering with the aquatic team.

Also, many thanks to **Karin Schlappa**, a University of Hawai'i CESU cooperator, who is the longest serving member of the I&M team. She joined the program in 2004 and has admirably functioned as both the Inventory Coordinator and the lead author on the climate monitoring protocol. We wish her the best of luck.

**Ben Mcmillan** joined the NPS I&M team in March as the network GIS Specialist. Prior to the NPS, he served as the Program Manager for the U.S. Pacific Air Forces GIS initiative known as "GeoBase" or IGI&S. He guided that program from multiple "silo" or stove-piped systems to a federated enterprise database system supporting on-site capabilities as well as a world-wide geospatial service oriented architecture. Though Ben was brought on as a geospatial expert, he also has a passion for marine and terrestrial ecology. He has worked with the Oregon Department of Fish & Wildlife, Oregon State University, University of Maine, Bigelow Laboratory for Ocean Science, and L-3 Communications (DOD). He has a 15-month-old daughter named Olivia. His wife, Charmaine Higa McMillan, grew up in Hilo and is a professor at UH-Hilo in the Department of Psychology.



**Tonnie Casey** spent her youth at Mānoa Elementary with intermediate school on Wake Island and high school at Punahou. She went to UH Mānoa for her bachelor's degree. She has had two fun scientific forays into Waiho'i Valley and Hana Rain Forest highlighted by a cooperative description of a new genus and species of bird from Maui, the Po'o uli. Tonnie went to Colorado State University for a Master's of Science project on Maui birds. Later, she did a stint at University of Illinois and took a trip to Guatamala and Belize with Princeton's Tropical Ecology course. After leading nature tours for Questers Tours and Travel to Hawaii, New Zealand, Australia, Alaska, and Trinidad and Tobago, she spent several years in NZ leading ski tours, doing ornithological projects, and writing for a local ski magazine. After coming home to Hawaii, she launched a trail horse business in Lā'ie on O'ahu and sold it to join the Army. Graduating with honors from the Intelligence School, she became an officer and went to flight school; flying TH-55s, and UH-1s. After tours of duty in LA, AL, and VA, she came back to HI to command the HIARNG helicopter unit in Hilo. She spent 11 years with Kamehameha Schools as their first wildlife biologist. Following a reorganization, she left and went to MO for 3 years, learning all about tornadoes, snow, and Missouri Fox Trotters (MFT). She now resides in Volcano with her small herd of MFTs and her 16.5 year old Jack Russell called Rum, an Animal Planet star.



## Monitoring Schedule

### July

Implement focal terrestrial plant community monitoring in rain forest at HAVO  
Vegetation mapping field data collection at HAVO  
Vegetation mapping field data collection on Ta'u island at NPSA  
Complete accuracy assessment field work for vegetation mapping at AMME and WAPA  
Benthic marine and marine fish monitoring at KALA  
Freshwater stream animals monitoring at NPSA

### August

Monitor rain forest plant communities at HAVO  
Monitor established invasive plant species at HAVO  
Vegetation mapping field data collection at HAVO  
Vegetation mapping field data collection at KALA  
Freshwater stream animals monitoring at KALA

### September

Monitor rain forest plant communities at HAVO  
Monitor established invasive plant species at HAVO  
Vegetation mapping field data collection at KALA  
Water quality monitoring at KALA

On-going water quality monitoring in all parks except VALR

## EXTRA !

The critically endangered Maui parrotbill (*Pseudonestor xanthophrys*) lives in native forests on the slopes of Haleakalā on Maui. For many years this species has been known primarily as the Maui parrotbill. The original Hawaiian name for this unique bird has been lost to antiquity. For the past few years, Hawaiian language experts and conservationists have been working on an appropriate new name for the species. After much thought and deliberation, the consensus name was recently unveiled. From this time forward, this small and very rare bird will be known in Hawaiian as the **kiwikiu**. For more on this story and on the kiwikiu, visit the Maui News online at: <http://www.mauinews.com/page/content.detail/id/531738.html?showlayout=0>

Photo of kiwikiu chick  
by G. Ackerman





# Fish Harvest News

Last month, I&M had the honor of interviewing Mr. Lilio, a matai (chief) from Fagasa village in American Samoa. He is an authority on the only traditional atule (*Selar crumenophthalmus*) harvest still practiced on Tutuila Island today. Other villages in the Manu'a Island group of American Samoa use a similar strategy.

The entire village participates in this harvest ritual once every few years. For a period before the harvest a village-imposed fishing restriction is placed on the bay. When the time is right and the atule have come into the bay, the village men take coconut fronds into the water. The men form a semi-circle from the shore to about 100 yards into the ocean. They work together shaking the fronds in the water to corral the fish into traps near the shore.

Once the harvest is complete, the fish are divided up equitably among the villagers. These traditional practices of harvesting fish handed down from generations past established a method for conserving the resource by forbidding fishing at certain times.

Mr. Lilio shared his perspective of the dwindling marine resources in his village, and the changes he has witnessed through the years. He emphasized the importance of conserving and respecting the marine resources as his forefathers had done. Traditional management of the resources may help ensure they will be available for the next generation. Let's hope Fagasa's next harvest is just as good.



After the communal fishing effort the atule catch is divided up among the villagers



The entire village works together to harvest the fish in the bay on this special day



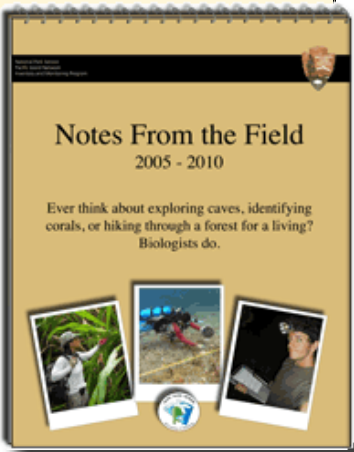
# Come to the Field with Us (Virtually)

*This is what natural resources monitoring is all about !*

You will be happy you took a few moments to watch short videos of monitoring in action; as scientists journey all over Pacific island national parks to keep tabs on unique natural resources.

To view these movies requires a (.mov) file player. Click [here](#) for a link to Quicktime™ free download.

Also check out the new booklet called *Notes from the Field*; first-hand accounts from scientists.



Click here  
—>

Click on the titles of your choice and allow a few minutes for download.

**Landbirds Monitoring** (12 Mb) *Brand New!*  
*Feathered Colonizers*

**Benthic Marine Monitoring** (12.0 Mb)  
*From Polyp to Benthic Jungle*

**Terrestrial Plant Communities Monitoring** (9.1 Mb)  
*Sustaining Life*

**Freshwater Animals Monitoring** (11.1 Mb)  
*Pincer, Foot, and Fin: Critters on the Cusp*

**Seabirds Monitoring** (9.8 Mb)  
*Bridging Land and Sea with a Belly Full of Fish*

**Water Quality Monitoring** (9.6 Mb)  
*Life's Essential Ingredient*

**Climate Monitoring** (8.8 Mb)  
*Patterns in the Sky*

**Marine Fish Monitoring** (9.8 Mb)  
*Swimming Long into the Future*

All monitoring videos can be found at:  
[http://science.nature.nps.gov/im/units/pacn/outreach/vs\\_videos.cfm](http://science.nature.nps.gov/im/units/pacn/outreach/vs_videos.cfm)

# Pacific Island Network — *Hot Topic*

## How to Talk with a Biologist (Quiz)

Every profession develops lingo. A carpenter may ask you to hand her a 3/8 inch sink bit. A chef may provide you a ramekin on the fly. When you stare at the chef or carpenter blankly, they may realize that you need to know certain terminology before you can complete the task or even understand. The broad field of biology is notorious for lingo. Biologists use very specific terms for actions or characteristics of a landscape, tool, animal, or plant. Perhaps the most perplexing aspect of biologist lingo is the use of common terms in different ways such as community, rigorous, and canopy. To understand what biologists mean by these and other terms, take the multiple choice quiz below. Then take a biologist out to dinner and engage in a stimulating conversation.

For more PACN quizzes visit: [http://science.nature.nps.gov/im/units/pacn/outreach/Quiz\\_book\\_web.pdf](http://science.nature.nps.gov/im/units/pacn/outreach/Quiz_book_web.pdf)

### Multiple choice (see answers and rank at bottom)

- Anchialine pool**
  - A small pool of surface water made of porous rock and fed underground by both freshwater and ocean water
  - A small body of water which does not surpass the knee when standing in the deepest part
- Transect**
  - A straight line through a natural feature along which observations are made or measurements are taken
  - The movement of a biologist through a section of a Standard Operating Procedure
- Benthic**
  - Any fossil or stone identified as originating in prehistoric oceans
  - The plants and animals found on the sea floor
- Watershed**
  - A storage house for hoses and buckets in preparation for fire
  - An interconnected drainage basin of water from rain or snow eventually leading to an ocean or other body of water
- Mesic forest**
  - A forest containing a moderate amount of moisture
  - A forest chosen for study due to its cultural significance
- Passerine**
  - A group of birds defined, in part, by feet adapted for perching; including all songbirds
  - A complex navigational system for tracking birds
- Quadrat**
  - The name given to a certain rodent behavior whereby the rodent employs all four limbs as if they were arms
  - A square or rectangular area marked off and isolated to determine the plants or animals occurring in the area
- Rigorous data**
  - Any data collection after which the biologist winds up exhausted
  - Extremely thorough, exhaustive, or accurate data
- Canopy**
  - The uppermost trees or branches in a forest, forming a layer of foliage
  - A canvas or plastic covering for long-term storage of gear
- Riparian**
  - Of or relating to riverbanks or wetlands adjacent to rivers or streams
  - A designation given to any animal who feeds on over-ripe fruit
- Pelagic**
  - Inhabiting the upper layers of the open sea (usually associated with fish)
  - Dried hair follicles of marine mammals
- Community**
  - A group of organisms which tends to feed at the same time
  - A set of organisms found in the same habitat at the same time
- Indigenous species**
  - Any species of bird or mammal that communicates in a distinct local dialect
  - A species originating or occurring naturally in a particular place

### Score and Rank:

12-13 = Biologist, 9-11 = Nature enthusiast, 5-8 = Novice, 0-4 = Time to retake the quiz

Answers: a, a, b, b, a, a, b, a, a, a, b, b



Hitting the Ground... Monitoring

"The forest eats itself and lives forever"  
~ Barbara Kingsolver



I am fortunate to often witness the everlasting processes implied by these words (one of my favorite quotes). Each day, the National Park Service Inventory and Monitoring Program vegetation field crew hikes in the lush treefern (*Cibotium glaucum*) forests of Hawai‘i Volcanoes National Park (HAVO). Massive and majestic ‘ōhi‘a trees (*Metrosideros polymorpha*) are often covered in soft, squishy mats of bryophytes and dripping with delicate ferns. These plants are usually joined by ‘olapa (*Cheirodendron trigynum*) and other native trees silently witnessing our intent movement through a maze of fibrous trunks and protective overlapping fronds. This describes ‘Ōla‘a wet forest, one of two areas where we are conducting intensive monitoring in the first year of the focal terrestrial plant communities protocol. The protocol provides park managers with sound data on vegetation status and trends within five community types found throughout Pacific Island Network parks, they are: wet forest, subalpine shrubland, coastal strand, mangrove, and limestone forest. Within these communities, we utilize a combination of permanent and temporary plots to gather information on both temporal (changes over time) and spatial scales.

Our hikes are long, ranging from three to seven hours each day, and are typically peppered with conversations about delicious foods, stops to add or remove clothing as the mist drifts in and out, and nerdy squeals of delight as we catch glimpses of plants like *Trematolobelia grandiflora*, *Melicope pseudoanisata* (photo at right), and

*Sadleria souleyetiana*. Our field plots are often in remote locations, so before we go into the field we communicate with the Inventory and Monitoring GIS specialist and park resource managers to access information about the areas, and create maps to guide us. This logistical preparation helps us to become familiar with the roads, trails, and park fences on the path to reaching a desired location, and facilitates planning to maximize efficiency in the field.



This downed tree has become a nurse log for native seedlings and ferns

Within this forest we often see large trees with exposed roots, like stilts; evidence that a nurse log has decayed

Our mission is to locate and reach certain points within the forest and establish 20 m x 50 m monitoring plots. Once a plot has been set up, we photograph, mark GIS waypoints, and draw up a map and description about the plot and how to access it. We then go about data collection.

To get an idea of which plants are present and how they are distributed in the forest vertical profile, we start by identifying and generating a list of all species present within each plot. We collect additional data along three 50 m long transects (temporary straight lines) within the plot.

To capture understory composition (plants under 2 m tall) and information on forest regeneration, we count tree seedling, small treefern, and shrub numbers to determine densities. Then we count larger trees and treeferns so that the densities of different larger species can be calculated as well. Finally, we measure canopy tree height and coarse woody debris. Combined, these measurements give us a good idea of the plant community of the area.

With so much data to gather, we are glad to have a very enthusiastic and experienced team. We work together to fine tune our methods, establish rules, and come up with solutions for situations that may be encountered in the future. So far, the vegetation field crew has been working in ‘Ōla‘a, but in the coming months we will be working in wet forests of the Nāhuku (formerly Thurston)/East Rift areas of HAVO. In future years, the project crew will travel to other parks in Hawaii as well as to American Samoa and the Mariana Islands; where many more exciting plant monitoring adventures await within the variety of unique plant communities this protocol aims to monitor.

—C. Yanger, Plant Biotech



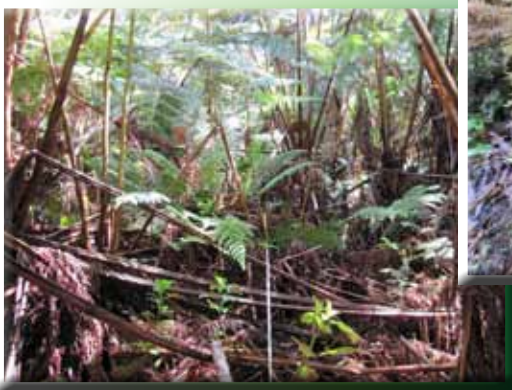
An uncommon species in the citrus family, *Melicope pseudoanisata*, is named for the strong anise scent of its crushed leaves

Plant communities monitoring has begun in the wet forests of Hawai‘i Volcanoes National Park (‘Ōla‘a, Nāhuku, & East rift zone). Next year we will monitor in the Hawai‘i Volcanoes National Park subalpine areas of Mauna loa and Kahuku. In addition, Kahuku wet forest and Kaloko-Honokōhau National Historical Park coastal strand communities will be monitored. In 2012, we will tackle Haleakalā NP wet forests and subalpine zones, and Kalaupapa NHP wetlands and coastal strand communities. By 2013, we will be prepared to take on the impossibly steep wet forests of the National Park of American Samoa. Finally in 2014, we will travel to American Memorial Park to monitor the mangrove forest and War in the Pacific NHP to monitor the unique limestone forest communities.

Then we start over.



Plant monitoring team member Laura Arnold investigates an outplanted *Platydesma spathulata*, another species in the citrus family



Forest typical of ‘ōla‘a — view from a plot corner



Tree trunks and stumps heavily laden with mosses and native ferns are a common example of how the forest grows on top of itself



Biotech Corie Yanger measures a treefern



## Trials on the Trail to Developing an Anchialine Pool Monitoring Protocol

In the remote coastal regions of Hawai'i Volcanoes National Park (HAVO) numerous techniques are being tested to monitor fauna in anchialine pools (brackish water habitats found in coastal lava fields). Requiring strenuous hikes of over eight miles to the coastline at and around an area known as Halapē, field technicians are trying to determine the best method to survey shrimp populations. Not only are there five different shrimp species inhabiting these unique ecosystems, but there are many other animals that either live in or use anchialine pools as well. For instance, certain damselflies and dragonflies lay their eggs on the surface of the pools. Other animals found in the anchialine pools include snails and fishes.

Over the past year many volunteers and technicians have conducted fauna survey trials at Halapē. Last summer (2009) biotechs and volunteers performed trapping surveys over the course of a few months. The results were surprising. Traps that worked well in anchialine pools in West Hawai'i national parks were not working at all in HAVO. Another method had to be attempted in order to develop an effective monitoring protocol.

During the early months of 2010, two field technicians again braved the extreme weather conditions on the rugged coastline. The first survey method they tried was photo identification. The photo identification method involved taking pictures of quadrats that were placed in the pools in select locations. These trials considered the differences between high tide vs. low tide, day vs. night, various types of bait vs. none, and time intervals of 15, 30, and 60 minutes. After a few weeks of high winds, the team ran into complications with the photo identification method.

After reevaluating the situation, the team decided to try visual surveys



Below and above water photos of a large anchialine pool on the Hawai'i Volcanoes National Park coastline

using the same quadrats as in the photo identification method. This required the technicians to actually snorkel in the pools to identify and count the shrimps within a given quadrat. This method yielded the best success rate yet.

Once the surveys were finished at Halapē, the team tested their new visual survey method at Pu'u'honua o Hōnaunau National Historical Park (PUHO). They also tested trapping methods again. Not only were the original traps tested, but new traps were developed and tested as well. Based on the results at PUHO the team decided to go back to Halapē in Hawai'i Volcanoes National Park to test visual and trapping methods once again.

Currently at Halapē, two different types of traps are being tested, along with the visual survey. The goal for this study is to compare the ratio difference of shrimp species and numbers between trapping and the visual surveys.

In short, it has taken many months, people, and effort to develop a sound method to monitor the shrimps in anchialine pools. As we start ruling out methods through trial and error, we are getting one step closer to developing the anchialine pool monitoring protocol.

—M. Jerolaman, Aquatic Volunteer



A native shrimp species 'ōpae 'ōeha'a (*Macrobrachium grandimanus*) attracted to coconut bait



Shading the photographer from the sun was a necessary, but not ideal, technique to photograph a quadrat



One type of trap for small native shrimp which has proven somewhat successful